March 27, 2003

Mr. Donald C. Pepe
Chief Administrator
4100 Sardis Road
Murrysville, PA 15668

**Subject**: Establishing a leaf/small brush recycling program in Murrysville, PA

Dear Don:

This letter report serves to provide the Municipality of Murrysville with the recommendations to establish a mandatory leaf/small brush residential recycling program. The Municipality is mandated to recycle these materials via curbside collection because its population of 18,872[1] exceeds the 5,000 threshold in the Municipal Waste Planning, Recycling and Waste Reduction Act (Act 101)[2].

## ESTABLISHING A LEAF/SMALL BRUSH RECYCLING PROGRAM IN MURRYSVILLE

This report is structured as follows:

- Municipality demographics;
- Current solid waste management system;
- Materials estimates;
- Mechanisms available for implementing a leaf/small brush recycling program; and,
- Conclusions and recommendations.

[1] U.S. Census Bureau, Profile of General Demographic Characteristics

[2] Large generators of yard waste, such as institutions and golf courses, are also required to recycle yard waste. However, these generators traditionally contract with landscapers and it is the landscapers, responsibility to assure that the materials is not landfill disposed. Therefore, this report evaluates alternatives for residential yard waste generators.

## DEMOGRAPHICS[3]

The Municipality of Murrysville is located in Westmoreland County and is approximately 20 miles east of Pittsburgh, Pennsylvania. Murrysville borders eight other communities. Murrysville covers 37 square miles and is 50 percent developed, with the more densely populated areas located near the Route 22 corridor in the western portion of the Municipality. Based on the 2000 U.S. Census, the population of Murrysville is 18,872 and an estimated 7,083 households are in the Municipality.

## CURRENT SOLID WASTE MANAGEMENT SYSTEM

Currently, Murrysville and the adjacent Borough of Export have a multi-municipal solid waste management contract with Greenridge Reclamation Services, which is owned by Republic Waste Services. Pursuant to this contract, residents receive weekly refuse collection and are permitted to set out one large item per month. Residents also receive every other week collection of the following recyclables:

- PET and HDPE containers;
- Aluminum and bi-metal food and beverage containers;
- Clear, green and brown glass food and beverage containers; and,
- Newspapers.

**The current contract does not require Greenridge to provide separate collection services for leaves and/or small brush**. The current contract expires in March of 2003 and Murrysville plans to exercise its option to extend the contract for one year.

## MATERIALS ESTIMATES

Based on municipal waste origin reports from the PA DEP, Westmoreland County disposed of 250,972 tons of municipal solid waste in 2001. R. W. Beck multiplied this disposal figure by the ratio of Murrysville's households to all households in the county (7,083 Murrysville households divided by 149,813[4] county households) to arrive at an estimated 2001 disposal quantity of 11,866 tons for Murrysville.

To estimate the quantity of leaves and small brush that would be available for a recovery program, R.W. Beck used the draft results of the 2001 PA DEP waste composition study data pertaining to Southwestern Pennsylvania[5]. The Municipality of Murrysville is classified as a suburban community by PA DEP. As demonstrated by Table 1, this classification in Southwestern Pennsylvania means that 3.3 percent of the municipal solid

[3] www.murrysville.com/about

[4] U.S. Census Bureau

[5] For purposes of this study, Southwestern Pennsylvania is comprised of Beaver, Washington, Greene, Allegheny, Fayette, Westmoreland, Armstrong, Indiana, Somerset and Cambria Counties.

waste stream is comprised of yard waste other than grass. Applying this percentage to the total quantity of waste disposed from Murrysville in 2001, 11,866 tons, yields a leaf and small brush disposal quantity of 392 tons.

## TABLE 1

## Landfilled Residential MSW Composition Detail by Demographic Sector in Southwestern Pennsylvania (Percent by Weight)

| | Material Categories | Urban | Suburban | Rural | Aggregate |
|---|---|---|---|---|---|
| | | | | | |
| Paper | | 29.8 | 30.9 | 30.3 | 30.6 |
| | Newspaper | 7.2 | 6.3 | 7.5 | 6.7 |
| | Corrugated Cardboard | 4.7 | 6.9 | 4.6 | 6.0 |
| | Office | 2.5 | 2.3 | 1.6 | 2.1 |
| | Magazine/ Glossy | 3.2 | 2.3 | 2.8 | 2.5 |
| | Polycoated/Aseptic Containers | 0.5 | 0.4 | 0.4 | 0.4 |
| | Mixed Paper | 4.8 | 4.2 | 3.0 | 3.9 |
| | Non-recyclable Paper | 6.9 | 8.7 | 10.4 | 8.9 |
| Plastic | | 7.8 | 10.4 | 12.1 | 10.5 |
| | #1 PET Bottles | 0.8 | 1.1 | 1.3 | 1.1 |
| | #2 HDPE Bottles | 0.7 | 1.0 | 1.3 | 1.0 |
| | #3-#7 Bottles | 0.4 | 0.2 | 0.1 | 0.2 |
| | Expanded Polystyrene | 0.5 | 0.6 | 0.7 | 0.6 |
| | Film Plastic | 3.2 | 4.2 | 4.9 | 4.2 |
| | Other Rigid Plastic | 2.2 | 3.3 | 3.8 | 3.3 |
| Glass | | 2.3 | 2.1 | 3.5 | 2.5 |
| | Clear Glass | 1.4 | 1.3 | 1.7 | 1.4 |
| | Green Glass | 0.2 | 0.2 | 0.3 | 0.2 |
| | Amber Glass | 0.6 | 0.4 | 0.7 | 0.5 |
| | Non-recyclable Glass | 0.1 | 0.3 | 0.8 | 0.4 |
| Metals | | 5.4 | 7.7 | 8.1 | 7.5 |

| | Material Categories | Urban | Suburban | Rural | Aggregate |
|---|---|---|---|---|---|
| | Steel Cans | 1.1 | 1.3 | 2.1 | 1.5 |
| | Aluminum Cans | 0.6 | 0.4 | 0.9 | 0.6 |
| | Other Ferrous | 2.3 | 4.6 | 3.9 | 4.2 |
| | Other Aluminum | 0.5 | 0.7 | 0.6 | 0.7 |
| | Other Non-Ferrous | 0.9 | 0.6 | 0.6 | 0.6 |
| Organics | | 41.6 | 36.4 | 31.1 | 35.8 |
| | Yard Waste- Grass | 2.3 | 5.4 | 2.7 | 4.3 |
| | Yard Waste- Other | 8.2 | 3.3 | 3.1 | 3.9 |
| | Wood- Unpainted | 5.7 | 5.2 | 2.6 | 4.7 |
| | Wood- Painted | 4.4 | 2.3 | 2.7 | 2.7 |
| | Food Waste | 11.2 | 10.3 | 11.4 | 10.7 |
| | Textiles | 3.9 | 4.9 | 3.5 | 4.4 |
| | Diapers | 2.0 | 2.3 | 3.3 | 2.5 |
| | Fines | 1.4 | 1.2 | 1.0 | 1.1 |
| | Other Organics | 2.5 | 1.5 | 0.8 | 1.5 |
| Inorganics | | 13.2 | 12.6 | 15.0 | 13.2 |
| | Electronics | 2.8 | 1.8 | 0.8 | 1.7 |
| | Carpet | 1.8 | 1.7 | 2.0 | 1.8 |
| | Drywall | 2.6 | 0.4 | 1.0 | 0.8 |
| | Other C&D | 3.3 | 2.6 | 8.1 | 4.0 |
| | HHW | 0.1 | 0.3 | 0.4 | 0.3 |
| | Other Inorganics | 2.7 | 5.6 | 2.8 | 4.5 |
| | Furniture | 0.0 | 0.1 | 0.0 | 0.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Pennsylvania State-wide Waste Composition Study Draft Report, data for Southwest Region.

Table 2 provides estimates of the annual quantity of leaves/small brush that could be captured based on low, medium and high participation in a yard waste recovery program. Table 2 also estimates the average weekly quantity of leaves/small brush that would be set out at the curb if all of the materials were collected during a 12-week period (eight weeks in the fall and four weeks in the spring).

### TABLE 2
### POTENTIAL CAPTURE RATES FOR LEAVES/SMALL BRUSH IN THE MUNICIPALITY OF MURRYSVILLE

| Per Household Leaves/Small Brush Generation Quantity | Low (1) | Medium (2) | High (3) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 0.06 TPY | 78 TPY | 157 TPY | 235 TPY |
| 0.005 TPW | 7 TPW | 13 TPW | 20 TPW |

(1) 20 percent or 1,417 households participating
(2) 40 percent or 2,833 households participating
(3) 60 percent or 4,249 households participating

## MECHANISMS AVAILABLE FOR IMPLEMENTING A LEAF/SMALL BRUSH RECYCLING PROGRAM

There are several options available to the Municipality of Murrysville for implementing a mandatory leaf/small brush curbside recycling program, including:

- Contracting for curbside service; and
- Contracting for or operating a leaf vacuum program.

### CONTRACTING FOR A LEAF/SMALL BRUSH CURBSIDE COLLECTION PROGRAM

An option available to the Municipality of Murrysville is to contract with a private waste hauler to collect leaves/small brush at the curb. No grass clippings would be accepted. With this type of program, residents would be required to contain leaves and brush in either 35-gallon rigid containers or biodegradable Kraft paper bags. With respect to Kraft paper bags, the Municipality, private retailers or both could distribute bags. For example, Penn Hills, Pennsylvania purchases Kraft paper bags and sells them directly to residents at cost if they come to the public works building to purchase them. Penn Hills also notifies local retailers such as grocers, hardware stores and pharmacies about the availability of the bags. These retailers then purchase the bags at cost from Penn Hills and sell them to their customers. According to Penn Hills, the majority of bags are purchased through the retailers, and purchasing 25,000 bags for 20,000 residents is adequate. Two companies that distribute Kraft paper bags in Southwestern Pennsylvania are:

**Danon Enterpirses, Inc**.
PO Box 4470
Stanford, CT 06907
1-800-348-3266

**Pabco Industries, LLC**
166 Frelinghuysen Avenue
Newark, NJ 07114-1694
1973-242-2200

In a curbside program, limbs, hedge clippings, or shrubs less than 1½ inches in diameter could also be accepted. Residents would be required to tie the materials in either bundles not exceeding four feet in length and 60 pounds in weight or placed in a reusable container. Limbs larger than 1½ inches in diameter would not need to be tied, but residents would be required to cut the limbs into four-foot lengths and place them with the large ends toward the street.

Since Murrysville will be accepting leaves and small brush, the collection program will most likely be needed two months in the fall and a month in the spring. For the convenience of residents, the Municipality should try to schedule leaf/small brush collection on the same day that residents set out their refuse. This recommendation is especially true for Murrysville since residents already have a different schedule for recycling collection.

R.W. Beck is aware that the Municipality's current waste hauler uses 25 cubic yard packer trucks and may use the same vehicles for collecting yard waste. On average, this size of vehicle can collect approximately six to seven tons of yard waste from approximately 800 households per route. Thus, if the Municipality has a low participation rate of 20 percent, the contractor may be able to collect the 10 tons from the 1,417 households on one day per week using one or two trucks. Conversely, if 60 percent or 4,249 households participate, yard waste may need to be collected on multiple days unless the hauler can operate as many as five collection vehicles.

Murrysville has received a preliminary quote of $700 per day to collect leaves/small brush at the curb. This cost estimate is based upon a standalone agreement with the Municipality's current contract hauler for solid waste. Table 3 provides cost estimates based on this collection cost and low, medium and high participation levels.

### TABLE 3
### ESTIMATED LEAF/SMALL BRUSH COLLECTION COSTS

| Participation Level | Number of Households Participating | Number of Truck-Days Required to Collect | Estimated Cost to Collect per Week[6] [put the footnote below the table, not page bottom] | Estimated Cost to Collect for Twelve Weeks |
|---|---|---|---|---|
| Low | 1,417 | 1.8 | $1,240 | $14,874 |
| Medium | 2,833 | 3.5 | $2,479 | $29,749 |
| High | 4,249 | 5.3 | $3,719 | $44,623 |

Beyond collecting the leaves/small brush, Murrysville may also have to pay for processing the material at a composting facility. To estimate this cost, R.W. Beck used an estimate of $20.00 per ton tipping fee based on active composting of the material. The actual cost may be higher or lower, depending upon the bids the Municipality receives.

[6] Based on $700 per day per collection crew

Table 4 summarizes estimates for the quantities of material that would be collected, collection costs, processing costs, and total program costs at low, medium and high participation levels.

### TABLE 4

### Estimated Processing and Total Costs

| Participation Level | Tons Collected | Processing Costs[7] | Estimated Cost to Collect for Twelve Weeks | Total Costs |
|---|---|---|---|---|
| Low | 78 | $1,560 | $14,874 | $16,434 |
| Medium | 157 | $3,140 | $29,749 | $32,889 |
| High | 235 | $4,700 | $44,623 | $49,323 |

It should be noted that the figures in Table 4 are estimates and the actual cost will depend on the bids submitted to the Municipality of Murrysville and program participation.

## VACUUM LEAF COLLECTION

Operations

Another curbside recycling option R.W. Beck evaluated for Murrysville is to collect loose leaves from residents using a vacuum. Under this system, residents would rake leaves to the curb. Residents would be instructed not to place leaves in the street as this would cause storm sewers to clog and may create traffic hazards. In contrast to the first option, small brush would not be able to be collected using a leaf vacuum system, as such materials may damage the leaf vacuum machine.

Based on our experience with similar-sized communities as Murrysville, it is expected to require five days a week for two months to collect the leaves during the fall and five days a week collection for one month to collect leaves in the spring from Murrysville's residences. To avoid leaves at the curb during the entire collection period, the Municipality may want to divide itself into two zones. With a zone system, the Municipality would collect community-wide during the first and last weeks of collection in the fall and the first week in the spring. Each zone would receive a minimum number of scheduled collection weeks. Residents would be instructed that crews may come to their house anytime during the scheduled week and they should place leaves at the curb by Monday of their scheduled week. Also, cars would not be able to be parked on the street during the scheduled week.

[7] Based on $20 per ton

Costs

R.W. Beck was unable to identify a local company who provides leaf vacuum services in Westmoreland County. Thus, the costs associated with program were estimated based on the Municipality providing the service, including the purchase of a leaf vacuum. Specifications on the leaf vacuum are provided in Attachment A.

PER-TON PROCESSING COST: $20.00

OTHER ANNUAL COSTS: $36,192

A) Leaf Vacuum[8] $2,592

B) Transportation Costs[9] $14,400

C) Labor[10] $19,200

Since the Municipality would be providing this service, the cost of this program may be even higher since crews will need to be diverted form other public services, such as snow removal or street repairs. This diversion may make it necessary for the Municipality to hire temporary workers at a higher rate, or delay repair projects, which may increase the cost of the project.

Table 5 provides estimates of program collection and processing costs based on low, medium and high participation.

**TABLE 5**
**ESTIMATED COSTS FOR A TWELVE-WEEK VACUUM LEAF PROGRAM**

| Participation Level | Tonnage | Other Costs | Processing Costs | Total Costs |
|---|---|---|---|---|
| Low | 78 TPY | $36,192 | $1,560 | $37,752 |
| Medium | 157 TPY | $36,192 | $3,120 | $39,312 |
| High | 235 TPY | $36,192 | $6240 | $42,432 |

## CONTRACTING FOR A LEAF/SMALL BRUSH DROP-OFF PROGRAM

Operations

Some communities supplement their curbside collection program with weekly leaf/small brush drop-off collection services. This type of system is typically found in communities

[8] $12,000 leaf vacuum financed at 8% over five years

[9] Based on $12 per mile, 20 miles per day five days per week for 12 weeks. Cost estimate includes insurance, tires, truck maintenance, inspections, licensing, taxes, fees and fuel

[10] Based on $40 per hour for eight hours per day, five days per week for 12 weeks.

where residents have the option of subscribing for curbside collection. Under this system, a staffed drop-off site would be available to residents on specified days and operating hours. Typically, communities make these sites available on weekends, during daylight hours and leaf generation months. The most appropriate sites possess the following characteristics:

- Have an area sufficient to hold vehicles preparing to drop off leaves/small brush without interfering with any main thoroughfare;
- Have a paved surface allowing an entrance and exit that will not impede traffic flow; and,
- Are well-known, identifiable sites.

The contractor stations a roll-off container that is approved by the community at the site. The contractor also provides an attending employee on site during operating hours, whose responsibilities include:

- Verifying the leaves/small brush comes from municipal residents;
- Ensuring trash is not illegally dumped into the container;
- Loading the incoming material into the roll-off container;
- Keeping the site clean;
- Disseminating brochures and other promotional materials; and,
- Counting vehicles.

Typically, residents are permitted to bring the following to the site:

- Leaves/small brush in rigid containers or heavy-duty Kraft paper bags that do not exceed 35-gallons; and/or,
- Brush or branches cut in lengths no longer than four feet and tied into bundles that can be easily handled by one person.

If materials are brought to the site in plastic bags, the contractor has the responsibility of removing the material from the plastic bags before placement into the waste packer or other suitable container, and providing a refuse container for the disposal of plastic bags.

Costs

Based on similar programs, the cost for an eight-week drop-off program in the fall and four-week drop-off program in the spring may be as follows:

PER-TON PROCESSING COST: $20.00

OTHER ANNUAL COSTS: $7,584

A) Site Maintenance[11] $220 per day X 24 days = $5,280

B) Transportation Costs[12] 8 miles per day x 24 days X $12 per mile = $2,304

Table 6 provides estimates of program collection and processing costs based on low, medium and high participation.

**TABLE 6**
**ESTIMATED COSTS FOR A TWELVE–WEEK LEAF/SMALL BRUSH DROP–OFF PROGRAM**

| Participation Level | Tonnage | Other Annual Costs | Processing Costs | Total Costs |
|---|---|---|---|---|
| Low | 78 TPY | $7,584 | $1,560 | $11,544 |
| Medium | 157 TPY | $7,584 | $3,120 | $13,104 |
| High | 235 TPY | $7,584 | $6,240 | $16,224 |

It should be noted that these are just estimates and the actual cost will depend on the bids submitted to the Municipality of Murrysville.

## RECOMMENDATIONS

For Municipality residents, curbside and vacuum leaf collection is are two methods for complying with the requirements of Act 101. However, vacuum leaf collection programs are very difficult for communities to operate. They are extremely labor-intensive, and it is difficult to guarantee adequate staffing, especially since leaves are collected during snow-removal seasons. Additionally, the leaves can clog the storm water drains and any level of brush/limb contamination may cause vehicle breakage. Finally, residents would be required to separate brush and limbs from the leaves, which decreases customer convenience.

Therefore, R. W Beck recommends that the Municipality of Murrysville initiate a separate contract for curbside collection of leaves/small brush for the fall of 2003. R.W Beck recommends weekly collection versus every other week since cost savings would be minimal, and may even be higher if the contractor incurs overtime because of the larger volume of materials that would be set out every other week.

[11] Includes staffing the site with one employee at $40 per hour for 8 hours per day and removing illegally disposed material in between collection events

[12] One eight- mile round trip per day between Murrysville municipal building and J.A. Rutter Company. Cost estimate includes insurance, tires, truck maintenance, inspections, licensing, taxes, fees and fuel.

After 2003, the Municipality may want to "bundle" the leaf/small brush collection service with their refuse and recycling collection contract. The Municipality may also want to request quotes on an alternative collection schedule, such as every other week collection, or a shorter duration, such as six weeks in the fall. R.W. Beck does not recommend that the Municipality supplement the curbside collection program with drop-off sites for leaves/small brush.

Prior to implementing the curbside collection of leaves/small brush, the Municipality should initiate the following action items:

- Revise local ordinances to ban open burning of leaves and require residents to source-separate leaves/small brush prior to collection;
- Issue a Request for Bids for Kraft paper bags;
- Coordinate a meeting with local retailers to develop a distribution plan for Kraft paper bags;
- Have legal counsel review the provisions of Act 101 that pertain to yard waste management; and,
- Design and implement an outreach campaign for the yard waste collection program. The campaign should include information on what will be collected curbside (i.e. leaves/small brush but not grass); how the materials should be prepared for collection; the schedule for collection, where Kraft paper bags can be purchased and the benefits of composting leaves/small brush.

Thank you for allowing R.W. Beck to work with the Municipality of Murrysville, and please let me know if we can be of any further assistance.

Sincerely,
R.W. BECK, INC.

Karen M. Luken
Senior Director

## ATTACHMENT A

## Truck Loader Leaf Vacuums - up to 65 HP

- 12″ discharge diameter
- 18″ Diameter Vacuum Hose
- 12 Volt Battery
- 16 Gallon Steel Tank
- 65 Hp Wisconsin